Bülent Ecevit University – Faculty of Engineering – Department of Environmental Eng.
2014–2015 Fall Term - ENV 105 Introduction to Computer Science Final Exam
Selected Questions and Answers

Use below information and Excel screen shot on 5., 6, and 15. questions.

Fractional Bias (FB) is a tool to measure model performance. The formula of FB is given below:

$$FB = 2 \times \left(\frac{\overline{C_{mea}} - \overline{C_{mod}}}{\overline{C_{mea}} + \overline{C_{mod}}} \right)$$

Where,

$\overline{C_{mea}}$: average of maesured concentration
$\overline{C_{mod}}$: average of model concentration

	A	B
1	**Measured**	**Model**
2	1,2	1,4
3	1,8	1,7
4	2,3	2,2
5	3,0	2,9
6	3,7	3,7
7	4,5	4,6
8	5,7	5,6
9	8,2	8,0
10	11,1	11,0
11	14,7	14,9
12		

Data

5. A measured and modeled values are written in Excel sheet. Write a formula in B12 cell to calculate the value of FB (10 points).

6. Following information is given to judge model performance. If -0,5 ≤ FB ≤ 0,5 then model is **acceptable**, otherwise model is **not acceptable**! Write a formula in B13 cell to show whether the model ise acceptable or not (10 points).

15. By using information given in questions 5 and 6 write a Matlab Script that reads measured and modeled concentrations, calculates FB and decides whether the model is acceptable or not. Assume that Excel sheet is saved on current folder, named as "model.xlsx". Define two variable "mea" for measured concentrations and "mod" for modeled concentrations. After reading values from Excel script calculates and displays value of FB. Finally, script decides whether the model is acceptable or not.

The Matlab screen shot is given below. Fill in the blanks to complete script (20 points).

```
Command Window
    >> fbias

    FB =

        0.0036

    Model acceptable
```

mea= _____

mod= _____

FB=2* _____

if (_____) | (_____) disp(_____)

_____ disp(_____)

_____

ANSWERS

5.

=2*((AVERAGE(A2:A11)- AVERAGE (B2:B11))/(AVERAGE (A2:A11)+ AVERAGE (B2:B11)))

6.

=IF(B12>0.5;"not acceptable";IF(B12>=-0.5;"acceptable ";" not acceptable "))

15.

```
mea=xlsread('model.xlsx','Data','A2:A11');
mod=xlsread('model.xlsx','Data','B2:B11');
FB=2*((mean(mea)-mean(mod))/(mean(mea)+mean(mod)))
if (FB>0.5) | (FB<-0.5) disp('Not acceptable')
else disp('Model acceptable')
end
```